

12-D-59

Canada. Statistics Canada
Inventory Accounting Methods of
Canadian Manufacturers, 1949

D.B.S. REFERENCE PAPERS, 1949

Dominion Bureau of Statistics, Ottawa, Canada

ISSUED BY AUTHORITY OF THE RT. HON. C. D. HOWE, MINISTER OF TRADE AND COMMERCE

Government
Publication

No. 1

May 1949



Price 25 cents

12-D-59

INVENTORY ACCOUNTING METHODS OF CANADIAN MANUFACTURERS

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INVENTORY ACCOUNTING METHODS OF CANADIAN MANUFACTURERS *

1. INTRODUCTION

This report presents results of a survey of manufacturers' inventory accounting methods conducted by the Dominion Bureau of Statistics. Similar studies have been carried out in other countries, notably the United States, the United Kingdom and Australia, but heretofore adequate information on this phase of company accounting practice has not been available in Canada.

Accountants recognize a number of methods of valuing inventory for balance sheet purposes. The chief importance of the method adopted by a given firm lies in its effect on profits and on the value of inventory. Different methods of inventory valuation will result in significantly different values for profits and inventory in periods when prices are rising or falling.

Proper interpretation of statistics of inventory value, such as those collected annually and monthly by the Dominion Bureau of Statistics requires knowledge of prevalent methods of inventory valuation. It is desirable that the analyst have some idea of the extent to which apparent changes in aggregate inventory holdings reflect price changes rather than volume changes; and the degree to which rising or falling prices affect the value of reported inventory holdings is related to the inventory accounting methods adopted by firms.

In the calculation of economic aggregates, such as national income and gross national product, the question of inventory valuation is also of considerable importance. Inventory change is a component of gross national expenditure, and profits (including "inventory profits") are a component of national income. These aggregates are intended to measure only income and expenditure arising from current production in the economy; and it can be argued that inventory profits, which arise from changes in price levels, are more in the nature of capital or speculative gains.

This survey was begun by Mr. C.L. Barber, formerly of the Central Research and Development Staff of the Dominion Bureau of Statistics and completed by Mr. D.H. Jones, who also analyzed the returns received and prepared the table and the report.

The schedule used was designed with the assistance of the Canadian Chartered Accountants' Association. Valuable suggestions were also received from accountants of a number of the larger corporations, who were requested to comment on a draft schedule. A reproduction of the schedule is given in the Appendix.

* Prepared under the direction of A.S. Abell, Director, National Income Statistics, Research and Development Division.

II. METHODS, DEFINITIONS AND RESULTS

Schedules were distributed to 498 firms. Multiple plant firms were generally considered as one unit except where operations extended into several industries and different accounting methods were used in each. The survey was designed to include all firms with inventory of \$1,000,000 or more; about 10 per cent of firms with inventory between \$300,000 and \$1,000,000; and about one per cent of firms with inventory less than \$300,000, and gross production of \$50,000 or more. The control period was 1945 for multiple plant firms, and 1946 for single plants. (see Table)

Response, although not complete, was quite good. Of the 498 firms surveyed 414 sent back replies, complete or nearly so. (see Table)

A reproduction of the schedule will be found in the Appendix. Replies to questions 1, 6, 9, 14, 15, 16, 17 have not been tabulated for the purposes of this report but will be used as a guide to future classification of firms and for other purposes. The remaining replies were tabulated and classified into three main groups; large firms (inventory over \$1,000,000); medium firms (inventory \$300,000 to \$1,000,000); small firms (inventory under \$300,000).

All firms were asked to report separately for each of the three main subdivisions of inventory; raw materials, work in process, and finished goods. The majority of firms were able to classify their inventory in this way. However, some firms reported for only one or two classes of inventory, such as raw materials, and finished goods (work in process not separated), or raw materials only, or total inventory only. To avoid the tabulation and presentation problems involved in imposing a further cross-classification of the data (i.e., according to whether firms reported 3, 2, or 1 divisions of inventory), reports where less than three classes of inventory were indicated have been handled by an entry in a "not applicable" row, under the class or classes of inventory which were not specified.

Some firms divided inventory into more than three classes, and indicated different accounting treatment for each. For instance, raw materials might be divided between "coal" and "other". In such cases, both replies were tabulated and duplicating entries noted in the "duplications" row of the table.

Valuation of Inventory for Balance Sheet (Question 2)

Cost, and lower-of-cost-or-market valuations were used by almost all reporting firms, with a definite preference for the latter method indicated, especially amongst the larger firms. A few firms reported "market" in answer to this question. A number of other methods were reported and these have been combined, for presentation, into one group. Typical answers in this latter category were "ceiling price", "1939 price", "arbitrary value" and variants of selling price or cost, such as "cost less 10%"; "selling price less 25%". Explanations of the exact meaning of "cost" and "market", as used here, are given in the following paragraphs.

Definition of Cost (Question 3)

"Invoice cost" (i.e., the actual purchase price inclusive or exclusive of freight depending on the terms of sale) was not very widely used. It was most frequently found applied to raw material inventory. "Laid down cost" (invoice cost plus duty, shipping and handling costs) was widely reported for raw materials inventory, but relatively infrequently for work in process and finished goods inventory.

"Actual manufactured cost", which is defined below, was by far the most popular method for valuing work in process and finished goods inventory.

"Standard cost" was reported by a number of firms. In a standard cost system, unit costs are set each year (or more frequently) in terms of assumed rates of efficiency for the various operations of the plant. Subsequent comparisons of actual cost with standards provide a measure of the extent to which the assumed standards have been met in practice, thus furnishing a valuable check on efficiency. A number of other methods, including "ceiling price", "estimated manufacturing cost", "selling price less reduction to cost", and variations of standard cost, where some proportion of the total was "standard" and the balance "actual", were also reported. Firms reporting these methods have been combined in the "other" row of the Table.

Method of Determining Unit Cost (Question 4)

It is frequently difficult, if not impossible, to allocate costs incurred in manufacturing exactly between goods sold or issued, and goods on hand (inventory). However, actual identified cost (specific item cost) was reported quite frequently. Goods sold (or materials issued) are actually identified as to cost under this method. In the "first-in-first-out" method, which was reported less frequently, sales or issues are assumed to be from the oldest items in stock, and goods left in inventory are automatically valued at more recent costs. In a period of rising prices this method will show a relatively high value for inventory.

The method reported most frequently was "average cost". Several variants are in use. In one variant ("monthly average"), unit cost of sales or issues during a month is calculated by adding to inventory at the beginning of the month, purchases during the month, both in physical and value terms, and calculating, by division, average unit cost of this lot of goods. Cost of goods sold or issued during the month, and inventory at the end of the month, are then valued by means of this "average unit cost". In another variant of this method ("moving average") unit costs are recalculated each time a purchase is made, rather than at monthly intervals only. A supplementary questionnaire was sent to a number of firms reporting average cost, to determine which of the above variants was used most frequently. Most firms receiving this supplementary form indicated a preference for the monthly average method.

Components of Manufactured Cost (Question 5)

"Manufactured cost", for purposes of computing cost of sales, must of necessity, include all relevant costs. For the purpose of valuing inventory however, some elements of total cost may be omitted.

For a number of firms, manufactured costs, for purposes of inventory valuation, included only materials and direct labour. Most firms include, in addition, factory overhead (excluding depreciation). A high proportion

also included depreciation. A number also included a share of administrative expenses. A few firms included, in addition to the other costs, a share of interest on bank loans and municipal taxes. In interpreting the answers to Question 5, as tabulated, it should be noted that firms reporting under a given category will generally report also under all preceding categories. A firm reporting under "depreciation", for instance, will also report under "factory overhead excluding depreciation" and naturally will include in costs, materials and direct labour.

Meaning of Market (Question 4)

As interpretations of "market" differ, it is necessary to define the term. "Replacement cost" was reported most frequently. By "replacement cost" is meant the cost of acquiring the goods in question by the usual method of acquisition for the firm, whether this be by purchase or manufacture. Other methods, reported less frequently, were "estimated selling price", "estimated selling price less cost to sell and profit", and miscellaneous methods, which have been combined for tabulation, such as, "selling price less cost to sell", and "lower of (a) replacement cost, (b) selling price less cost to sell less normal profit".

Reserve Policy (Questions 10 and 11)

Frequently firms adjust their inventory value, as computed by the methods described above, by deducting a "reserve". This reserve is of sufficient size to yield what the firm's directors consider to be a conservative estimate of profit for the year. Almost half of the reporting firms indicated that they had such reserves. Larger firms reported reserves more frequently than the smaller ones. Approximately equal numbers reported that, (a) the reserve was shown separately on the balance sheet, (b) the reserve was not shown separately on the balance sheet.

Determination of Selling Price (Question 12)

Firms were asked to report whether "actual cost" or "replacement cost" was the more important factor in determining the selling price of their products. The majority of firms indicated that "actual cost" was the more important, however, the proportion favouring "replacement cost" was quite high.

Treatment of Goods in Transit in Inventory Accounting (Question 13)

The question is rather difficult to analyze without a knowledge of the distributive and financial structure of the firms, as for instance, whether or not they own their own wholesale or retail outlets, and whether or not

they are branch plants of U.S. corporations. However, a large number of firms reported that goods in "out-transit" were included in inventory, and a considerably smaller number included "in-transit" goods. Goods on consignment to other firms were frequently included, but only a few firms reported inclusion of goods received on consignment from others.

SURVEY OF MANUFACTURERS' INVENTORY ACCOUNTING METHODS
Number of Firms Reporting in Each Category,
Classified by Size of Firm

	Large Firms				Medium Firms				Small Firms				All Firms			
	328		57		51		113		71		498		414			
	Raw	Work in	Raw	Work in	Raw	Work in	Raw	Work in	Raw	Work in	Raw	Work in	Raw	Work in	Raw	Work in
	Materials	Process	Materials	Process	Materials	Process	Materials	Process	Materials	Process	Materials	Process	Materials	Process	Materials	Process
	(number of firms)				(number of firms)				(number of firms)				(number of firms)			
Question 2																
Valuation of Inventory for Balance Sheet:																
Cost	115	123	118	24	25	27	36	29	28	176	173	176	176	176	173	173
Lower-of-Cost or Market	180	126	157	11	26	15	29	17	27	235	199	154	154	154	199	199
Market	-	-	5	1	-	3	2	2	2	2	3	2	2	2	3	10
Other	4	5	5	1	-	1	1	1	5	6	11	7	7	7	11	11
Not Applicable	-	40	14	14	-	5	2	22	9	2	28	76	76	76	28	28
Duplications*	-7	-2	-7	-	-	-	-	-	-	-7	-7	-2	-2	-2	-7	-7
TOTAL	292	292	292	51	51	51	71	71	71	414	414	414	414	414	414	414
Question 3																
Definition of Cost:																
Invoice Cost	11	3	3	-	3	-	15	1	2	29	5	4	4	4	5	5
Laid down Cost	248	24	22	2	47	6	48	9	6	343	34	35	35	35	34	34
Standard Cost	26	47	49	5	1	6	3	3	4	30	59	55	55	55	59	59
Actual Manufactured Cost	-	173	193	25	-	33	2	33	46	2	272	231	231	231	272	272
Other	12	17	17	3	-	4	-	-	4	12	25	20	20	20	25	25
Not Applicable	1	40	21	16	-	5	3	25	9	4	35	81	81	81	35	35
Duplications	-6	-12	-13	-	-	-3	-	-	-	-6	-16	-12	-12	-12	-16	-16
TOTAL	292	292	292	51	51	51	71	71	71	414	414	414	414	414	414	414
Question 4																
Method of Determining Unit Cost:																
Specific Item Cost	54	63	63	14	14	16	35	27	31	103	110	106	106	106	110	110
First-in-First-Out	56	32	34	15	15	9	11	2	4	82	47	39	39	39	47	47
Average Cost	163	113	140	20	20	14	17	14	25	200	179	137	137	137	179	179
Last-in-First-Out	14	12	11	3	3	2	1	2	2	18	15	16	16	16	15	15
Other	15	28	30	1	1	5	1	1	2	17	37	31	31	31	37	37
Not applicable	-	46	19	-	-	6	6	25	10	6	35	87	87	87	35	35
Duplications	-10	-2	-5	-2	-2	-1	-	-	-3	-12	-9	-2	-2	-2	-9	-9
TOTAL	292	292	292	51	51	51	71	71	71	414	414	414	414	414	414	414
Supplementary to Question 4																
Method of Calculating Average Cost, Where Used:																
Monthly Average	31	18	24	3	3	2	9	5	11	43	37	24	24	24	37	37
Moving Average	16	7	7	2	2	1	4	3	5	22	13	11	11	11	13	13
Other	2	6	7	-	-	1	1	2	3	3	11	9	9	9	11	11
Not available*†	114	82	102	15	15	10	3	4	6	132	118	93	93	93	118	118
Duplications	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	163	113	140	20	20	14	17	14	25	200	179	137	137	137	179	179
Question 5																
Components of Manufactured "Cost":																
Direct Labour and Materials only	-	48	33	-	-	8	-	15	19	-	60	70	70	70	60	60
Factory Overhead, ex. depreciation	-	204	245	-	-	28	-	36	45	-	318	270	270	270	318	318
Depreciation	-	156	191	-	-	27	-	24	34	-	252	200	200	200	252	252
Share of Administrative Expenses	-	55	83	-	-	13	-	19	21	-	117	84	84	84	117	117
Other	-	14	20	-	-	3	-	2	2	-	25	19	19	19	25	25
Not Applicable	-	40	14	-	-	5	-	20	7	-	26	74	74	74	26	26

* Some firms reported under 2 or more categories.
 ** Not all firms reporting average cost were asked to give this supplementary analysis.

SURVEY OF MANUFACTURERS' INVENTORY ACCOUNTING METHODS (concl'd)

Number of Firms Reporting in Each Category,
Classified by Size of Firm

	Large Firms				Medium Firms				Small Firms				All Firms			
	Raw Materials	Work in Process	Finished Goods	(number of firms)	Raw Materials	Work in Process	Finished Goods	(number of firms)	Raw Materials	Work in Process	Finished Goods	(number of firms)	Raw Materials	Work in Process	Finished Goods	(number of firms)
Question 7																
Meaning of "Market":																
Replacement Cost	152	72	68		22	8	10		25	9	13		199	89	91	
Estimated Selling Price	5	8	31		1	3	3		1	1	7		7	12	41	
Estimated Selling Price; less cost to sell and profit	12	25	36		-	1	3		1	3	6		13	29	45	
Other	4	9	16		-	-	1		-	-	-		4	9	17	
Not Stated or Not Applicable	7	12	11		3	-	1		4	6	3		14	18	15	
TOTAL	180	126	162		26	12	18		31	19	29		237	157	209	
Question 8																
Application of "Market" Where Applicable:																
To Each Specific Item	144	91	116		19	8	12		23	11	18		186	110	146	
To Major Inventory Divisions	16	11	18		2	2	3		2	1	1		20	14	22	
To Inventory as a whole	15	16	19		3	2	3		4	3	6		22	21	28	
Not Stated or Not Applicable	5	9	10		2	-	-		2	4	4		9	13	14	
Duplications	-	-1	-1		-	-	-		-	-	-		-	-1	-1	
TOTAL	180	126	162		26	12	18		31	19	29		237	157	209	
Question 10																
Inventory Reserve Practice:																
No Reserve against Inventory	137				32				64				233			
Reserve against Total Inventory	98				9				3				110			
Reserve against one or more of raw materials, work in process, finished goods	57				10				4				71			
Not Stated or Not Applicable	-				-				-				-			
TOTAL	292				51				71				414			
Question 11																
Method of Setting Up Reserve:																
Separate amount, shown on balance sheet	77				13				2				92			
Separate amount, deducted before arriving at balance sheet figure	76				6				1				83			
Percentage reduction of some or all classes of items	1				-				2				3			
Other	4				-				1				5			
Not Stated	-				-				1				1			
Duplications	-3				-				-				-3			
TOTAL	155				19				7				181			
Question 12																
Factor Having Most Weight in Determining Selling Price:																
Actual Cost	156				27				50				233			
Replacement Cost	125				22				16				163			
Other	8				-				-				8			
Not Stated or Not Applicable	6				2				5				13			
Duplications	-3				-				-				-3			
TOTAL	292				51				71				414			
Question 13																
Treatment of Goods in Transit, and Consignments, in Inventory:																
Include materials in transit from firm	214				28				26				268			
" " " " to " "	66				6				15				86			
Include goods consigned to others	145				13				4				162			
Include consignments received from others	7				2				2				11			

APPENDIX

SAMPLE SURVEY SCHEDULE

Confidential Report on

INVENTORY ACCOUNTING METHODS

File No.

MANUFACTURING

Dominion Bureau of Statistics
Central Research and Development Staff

Please complete one copy of this report for each of your manufacturing plants and return on or before _____. All replies will remain strictly confidential to The Bureau of Statistics and your report will not be available to any other government department. Additional copies of this form may be obtained on request.

Name of Business

Head Office Address

Industry covered by this report

Location of plant for street and number
which this report is made city, town province

1. (a) What was the date of your balance sheet for the fiscal year ending nearest December 31, 1947?

(b) What was the value of your inventory at that date,

Dollars

Total

Raw materials and supplies

Goods in process

Finished goods

2. For balance sheet purposes for your fiscal year ending nearest to December 31, 1947, did you value your inventories at; check where applicable,

Raw Materials Goods in Process Finished Goods

(a) Cost

()

()

()

(b) Lower of Cost or Market

()

()

()

(c) Other (please explain)

3. In determining cost did you arrive at it by using: check where applicable
- | | Raw Materials | Goods in Process | Finished Goods |
|--|---------------|------------------|----------------|
| (a) Invoice Cost | () | () | () |
| (b) Laid down Cost
(Invoice cost plus, duty,
shipping and handling
charges) | () | () | () |
| (c) Standard Cost | () | () | () |
| (d) Actual manufactured Cost | () | () | () |
| (e) Other (please explain | | | |

4. In determining the unit cost figure to be used in each case, did you arrive at it by using
- | | Raw Materials | Goods in Process | Finished Goods |
|----------------------------|---------------|------------------|----------------|
| (a) Specific Item Cost | () | () | () |
| (b) First-in-First-Out | () | () | () |
| (c) Average Cost | () | () | () |
| (d) Last-In-First-Out | () | () | () |
| (e) Other (please explain) | | | |

SUPPLEMENTARY TO QUESTION 4.

If you use average cost in your accounts, in which of the following ways was it calculated?

- | | Raw Materials | Goods in Process | Finished Goods |
|---|---------------|------------------|----------------|
| (a) Monthly average (average of inventory value at beginning of month plus new materials purchased or costs incurred during the month). | () | () | () |
| (b) Cumulative or moving average (same as in (a) except the average is recalculated each time additional materials are purchased or incurred costs are transferred to the inventory account). | () | () | () |
| (c) Some other. (Please explain) | | | |

5. In determining your cost to manufacture your various products, did you include therein in addition to direct labor and direct materials,

	Goods in Process	Finished Goods
(a) Factory Overhead other than Depreciation	()	()
(b) Depreciation	()	()
(c) Share of administrative expenses	()	()
(d) Other, such as interest on borrowed money (please specify)		

6. If you used standard costs

	Raw Materials	Goods in Process	Finished Goods
(a) How often have your standard costs been changed in the past ten years?			
(b) At what dates were they changed?			
(c) What was the date of the last change?			
(d) What was the reason for the change in each case?			

7. In those instances where you used "market" did you take it to mean

	Raw Materials	Goods in Process	Finished Goods
(a) Replacement cost through usual channels?	()	()	()
(b) Estimated selling price?	()	()	()
(c) Estimated selling price less cost to sell and normal profit?	()	()	()
(d) Other? (please explain)			

8. In general, where you use "market" do you apply it to

	Raw Materials	Goods in Process	Finished Goods
(a) each specific item?	()	()	()
(b) major inventory divisions?	()	()	()
(c) your inventory as a whole?	()	()	()

9. What is the percentage increase in the unit prices at which the various items are included in your inventories? (give estimated percentage increase for each classification set out below) (See Instructions)

With respect to your inventory at your balance sheet date nearest Dec. 31, 1947, what was the

Raw Materials Goods in Process Finished Goods

(a) Percentage increase
over the previous year

(b) Percentage increase
over 1939

10. Have you any reserve for anticipated future declines in inventory values provided against your inventories in your fiscal year ending nearest December 31, 1947? (Answer Yes or No for each category)

Against Total Inventory only:	or	Against one or more of the following:		
		<u>Raw Materials</u>	<u>Goods in Process</u>	<u>Finished Goods</u>
()		()	()	()

11. If the answer to (10) is "yes" in respect of any classification, how was the reserve set up?

- (a) By separate amount shown on the balance sheet
(b) By separate amount not shown on balance sheet but deducted in determining figure or figures to be shown for inventories
(c) By percentage reduction of all or some classes of items (please explain)
(d) Other (please explain)

12. Of these two, which carries the most weight in determining the selling price of your product, check one,

- (a) Actual cost as shown by your records ()
(b) Replacement costs at current market price ()

13. In determining the materials to be taken into account for inventory valuation did you include, check where applicable
- (a) Materials in transit to you at the close of your fiscal period ()
 - (b) Materials in transit from you at the close of your fiscal period ()
 - (c) Materials owned by you but in the hands of others on a consignment basis ()
 - (d) Materials owned by others but in your hands on a consignment basis ()
14. What proportion of your production in 1947 consisted of
- | | Per Cent |
|---|----------|
| (a) Goods produced under binding orders | () |
| (b) Goods produced for inventory. (Orders filled out of finished goods inventory) | () |
| (c) Other (please explain) | |
15. What proportion of your inventory is hedged by the sale of options in commodity markets?
- | | Per Cent |
|--|----------|
| | () |
16. How, if at all, does the method used in valuing inventories for balance sheet purposes differ from the method used in reporting values of inventories on the Capital Schedule, Census of Industry, Dominion Bureau of Statistics? Describe below any major differences referring to the questions listed above by number.
17. (a) Have you, in the past, followed a consistent policy in valuing your inventories? Answer Yes or No ()
- (b) If no, describe briefly any major changes.
- (c) Were any important changes made during the current year? ()
- (d) If yes, please explain.

I hereby certify that the information given on this report is complete and correct to the best of my knowledge and belief.

Name and address of person making this report.

Date of this report

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